

IN THE DRAWINGS

The attached replacement sheet contains a revised Fig. 1 and replaces the original sheet labeled "1/5." Applicants note that reference numeral 42 in the original Fig. 1 references both an electrical sensor and a non-electrical motion determination system. In accordance with the specification, Fig. 1 is revised to replace reference numeral 42 with reference numeral 44 in referring to the non-electrical motion determination system. *See* Specification, p. 9, line 31. Applicants respectfully submit that the replacement sheet does not add any new matter to the application.

REMARKS

In the office action dated October 23, 2006, the Examiner rejected claims 1-40. By the present response, the specification has been amended, and claims 1, 3, 4, 10, 11, 15, 17, 18, 20, 22, 23, 25, 31 and 37-40 are amended. No new matter has been added. Upon entry of the amendments, claims 1-40 will remain pending in the application. In view of the foregoing amendments, Applicants respectfully request reconsideration and allowance of all pending claims.

Rejections Under 35 U.S.C. § 102

In the office action, the Examiner rejected claims 1-4, 6 and 15-18 under 35 U.S.C. § 102(b) as being anticipated by Pflaum, U.S. Patent No. 6,324,254 (hereinafter "Pflaum") and further rejected claims 25, 37, 38, and 40 under 35 U.S.C. § 102(b) as being anticipated by Liu, U.S. Patent No. 6,233,478 (hereinafter "Liu"). Applicants respectfully traverse these rejections.

Legal Precedent and Guidelines

A *prima facie* case of anticipation under 35 U.S.C. § 102 requires a showing that each limitation of a claim is found in a single reference, practice or device. *In re Donohue*, 226 U.S.P.Q. 619, 621 (Fed. Cir. 1985). Accordingly, the Applicants need only point to a single element not found in the cited reference to demonstrate that the cited reference fails to anticipate the claimed subject matter.

The Pflaum reference is missing features recited by Independent Claims 1 and 15

Applicants respectfully assert that Pflaum does not anticipate independent claims 1 or 15 under 35 U.S.C. § 102(b) because not every element of the claimed invention is disclosed. Specifically, claim 1 recites, *inter alia*, a method of "acquiring a set of motion data for *two or more* organs..." and claim 15 recites, *inter alia*, a computer program comprising "a routine for acquiring motion data for *two or more* organs..." (emphasis added).

After careful review, Applicants believe that Pflaum does not teach, disclose, or suggest a method or a computer program for imaging an organ comprising at least a step or routine of acquiring motion data for *two or more organs*. In contrast, Pflaum appears to disclose a “motion detection system . . . by means of which the vessel motion or the motion of *an organ* . . . can be acquired.” See Pflaum, col. 3, lines 60-63 (emphasis added). Accordingly, Pflaum appears to disclose a method of imaging an organ which is based on acquiring motion data for a *single organ*, rather than “two or more,” as recited in claims 1 and 15. A method directed at acquiring motion data for a *single organ* for imaging purposes is further supported by the claim language of Pflaum:

An X-ray device for picking up X-ray images of a vessel or organ exhibiting substantially rhythmic movement comprising:

...a monitor for identifying said substantially rhythmic motion associated with said vessel or organ and generation a motion-dependent signal corresponding to said motion...

See *id.* at claim 11 (emphasis added).

Applicants believe that Pflaum is absent of any language teaching or suggesting the acquisition of multiple sets of motion data for a *plurality* of organs. In view of this deficiency, Pflaum cannot anticipate independent claims 1 or 15, and therefore, dependent claims 2-4 and 6 are believed patentable over Pflaum by virtue of their dependency from claim 1, and dependent claims 16-18 are believed patentable over Pflaum by virtue of their dependency from claim 15. Applicants respectfully request allowance of independent claims 1 and 15 and their respective depending claims under 35 U.S.C. §102(b).

The Liu reference is missing features recited by Independent Claims 25 and 37

Applicants further assert that Liu does not anticipate independent claims 25 or 37 under 35 U.S.C. § 102(b) because not every element of the claimed invention is disclosed. Claim 25 recites, *inter alia*, “a sensor based motion measurement system configured to measure electrical or non-electrical activity indicative of the motion of *two or more* organs...,” and claim 37 recites, *inter alia*, “means for acquiring a set of motion data for *two or more* organs from at least one of one or more types of electrical sensors or one or more types of non-electrical sensors.” (emphasis added). In the office action, the Examiner specifically stated:

Liu teaches an imager configured to generate a plurality of signals representative of a region of interest; data acquisition circuitry configured to acquire the plurality of signals; data processing circuitry configured to operate at least one of the imager and the data acquisition circuitry; an operator workstation configured to communicate with the system control circuitry and to receive the processed plurality of signals from the data processing circuitry; and *a sensor based motion measurement system configured to measure electrical or non-electrical activity indicative of the motion of two or more organs within the region of interest* (col. 2, lines 2-11; col. 7, lines 45-65; col. 11, lines 17-39). Liu further teaches a system control for acquiring a set of image data representative of an organ of interest using two or more prospective gating points (col. 4, lines 66-67; col. 5, lines 1-10).

See Office Action, p. 3 (emphasis added).

The Examiner incorrectly alleges that Liu teaches a system for measuring the motion of *two or more* organs. Rather, Liu only appears to disclose a sensor based motion measurement system for a *single* “object,” such as, “an electrocardiograph for monitoring a beating heart to produce an electrocardiogram.” *See* Liu, col. 5, lines 24-29. After careful review, Applicants believe that Liu is absent of any language teaching or suggesting the acquisition of both electrical and non-electrical motion data for a *plurality*

of organs and processing the multi-input motion data to determine prospective gating points for imaging an organ of interest. In view of these deficiencies, among others, Liu cannot anticipate independent claims 25 or 37. Applicants respectfully request allowance of claims 25 and 37 under 35 U.S.C. §102(b).

The Liu reference is missing features recited by Independent Claims 38 and 40

Applicants respectfully assert that Liu does not anticipate independent claims 38 or 40 under 35 U.S.C. § 102(b) because not every element of the claimed invention is disclosed. Specifically, claim 38 recites, *inter alia*, a “means for acquiring a set of motion data for one or more organs from *at least two of one or more types of electrical sensors or one or more types of non-electrical sensors.*” (emphasis added). Claim 40 recites, *inter alia*, “a sensor-based motion measurement system configured to contribute to the set of motion data by measuring electrical or *non-electrical* activity ... within the region of interest *via at least two of one or more types of electrical sensors or one or more types of non-electrical sensors.*” (emphasis added).

After careful review, Applicants believe that Liu does not teach, suggest, or disclose acquiring sets of motion data from *at least two types of* sensors, as recited in claims 38 and 40. Liu appears to disclose the use of only a single *type of* sensor for acquiring motion data for a single object of interest. *See id.* Applicants believe Liu is absent of any language teaching or suggesting the use of more than one sensor type in a sensor based motion measurement system or any other means for measuring multiple sets of motion data for one or more organs. In view of these deficiencies, among others, Liu cannot anticipate independent claims 38 or 40. Applicants respectfully request allowance of independent claims 38 and 40 under 35 U.S.C. §102(b).

Rejections Under 35 U.S.C. § 103

In the office action, the Examiner rejected claims 5, 8-14, and 20-23 under 35 U.S.C. § 103(a) as obvious over Pflaum in view of Li et al., U.S. Patent No.

6,836,529 (hereinafter "Li"); claims 7 and 19 under 35 U.S.C. § 103(a) as obvious over Pflaum in view of Schweikard et al., U.S. Patent No. 6,144,875 (hereinafter "Schweikard"); claim 24 under 35 U.S.C. § 103(a) as obvious over Pflaum in view of Li as applied to claim 20, and further in view of Schweikard; claims 26-28 and 39 under 35 U.S.C. § 103(a) as obvious over Liu in view of Ustuner et al., U.S. PG Publication 2004/0006266 A1 (hereinafter "Ustuner"); claims 29-31 and 34-36 under 35 U.S.C. § 103(a) as obvious over Liu in view of Schlossbauer et al., U.S. PG Publication 2002/0091314 A1 (hereinafter "Schlossbauer"); and claims 32 and 33 under 35 U.S.C. § 103(a) as obvious over Liu in view of Schlossbauer, and further in view of Ustuner. Applicants respectfully traverse these rejections.

Legal Precedent and Guidelines

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d. 1430 (Fed. Cir. 1990). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985).

Additionally, when prior art references require a selected combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gained from the invention itself, i.e., something in the prior art as a

whole must suggest the desirability, and thus the obviousness, of making the combination. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 U.S.P.Q.2d 1434 (Fed. Cir. 1988). One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). The Federal Circuit has warned that the Examiner must not, “fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.” *In re Dembiczak*, 994 F.3d 999, 50 U.S.P.Q.2d 52 (Fed. Cir. 1999) (quoting *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983)).

The Pflaum and Li references, taken alone or in hypothetical combination, fail to teach or suggest features recited by independent claims 8 and 20

Turning to the claims, the present independent claim 8 recites, *inter alia*, “acquiring a set of motion data for one or more organs from at least two of one or more types of electrical sensors and one or more types of non-electrical sensors,” and claim 20 recites, *inter alia*, “a routine for acquiring a set of motion data for one or more organs from at least two of one or more types of electrical sensors and one or more types of non-electrical sensors.” (emphasis added). As discussed previously, Pflaum appears to disclose the use of only a single sensor type for acquiring motion data from a single organ. The Examiner stated that Li teaches the use of “acquiring data indicative of motion from two or more organs from two of one or more types of electrical sensors.” *See* Office Action, p. 5. Specifically, the Examiner cited the following passage from Li:

While EKG signals have heretofore been described as a means of developing an imaging profile, other data signals may be acquired and analyzed to develop an imaging profile including respiratory data signals.

See Li, col. 5, lines 44-47.

After careful review, Applicants believe that the Pflaum and Li references, taken alone or in hypothetical combination, fail to teach the use of *both* electrical *and* non-electrical sensors, as recited in claims 8 and 20. Although Li discloses the possibility of using different types of sensors to acquire respiratory data signals as an *alternative* to using an EKG sensor, it appears that Li fails to obviate the deficiencies of Pflaum because it does not suggest or teach the use of two or more sensor types in order to determine prospective gating points for imaging an organ of interest. In view of this deficiency, among others, Pflaum and Li, taken alone or in hypothetical combination, cannot render obvious the current independent claims 8 and 20 and claims depending therefrom.

The Liu and Schlossbauer references, taken alone or in hypothetical combination, fail to teach or suggest features recited by independent claim 31

Independent claim 31, as amended, recites, *inter alia*, “two or more sensor-based motion measurement systems, wherein each sensor-based motion measurement system is configured to measure electrical or non-electrical activity indicative of the motion of *two or more* organs within the region of interest.” (emphasis added). As discussed previously, Liu appears to disclose acquiring motion data from a *single* organ. Although Schlossbauer seems to suggest the use of multiple types of sensors for measuring electrical or non-electrical motion data, after careful review, Applicants believe the reference does not teach or suggest acquiring data from multiple organs. In view of this deficiency, among others, Liu and Schlossbauer, taken alone or in hypothetical combination, cannot render obvious the current amended independent claim 31 and claims depending therefrom.

The Liu and Ustuner references, taken alone or in hypothetical combination, fail to teach or suggest features recited by independent claim 39

Independent claim 39 recites, *inter alia*:

An imaging system comprising:

...system control circuitry configured to operate at least one of the imager and the data acquisition circuitry based upon two or more prospective gating points derived from a set of motion data describing the motion of *two or more organs* within the region of interest...

...a sensor-based motion measurement system configured to measure electrical or non-electrical activity indicative of the motion of at least one of the *two or more organs* within the region of interest to contribute to the set of motion data.

(emphasis added).

As discussed previously, Liu appears to disclose acquiring motion data from a *single* organ. In the office action, the Examiner stated that Ustuner “teaches activating one or two or more electrical sensors to measure more than one physiological parameter indicative of motion in *more than one organ*.” See Office Action, p. 7 (emphasis added). Specifically, the Examiner cited the following passage from Ustuner:

For temporal alignment, an ECG input 24 may be provided to the processor 18 or elsewhere in the system 10. The ECG input 24 is adapted for connecting with an ECG device for monitoring a heart cycle. *In alternative embodiments, the ECG input 24 comprises an input for other physiological cycle measurement devices, such as a device for measuring a breathing cycle.*

See Ustuner, paragraph [0039] (emphasis added).

After careful review, Applicants believe that Ustuner fails to teach or suggest the use of multiple sensors to measure electrical or non-electrical activity indicative of the motion of at least one of the *two or more organs*, as recited in claim 39. Rather, it appears

that Ustuner only suggests alternatives to using an ECG. This notion is further supported by Fig. 1 of Ustuner. *See id.* at Fig. 1. The ECG input (24) appears to be a single input communicating with a processor (18). When interpreting the figure with the above cited passage, it appears that Ustuner is only suggesting that the single input, though denoted as an ECG input, may instead be an input for other types of sensor devices (such as one for respiratory measurements). Accordingly, Applicants believe that Ustuner does not suggest using multiple sensor devices used to acquire motion data for multiple organs. In view of this deficiency, among others, Liu and Ustuner, taken alone or in hypothetical combination, cannot render obvious independent claim 39.

Dependent Claims

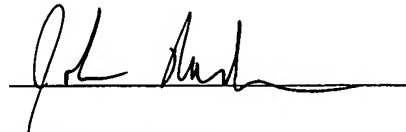
In the office action, the Examiner rejected the remaining dependent claims under 35 U.S.C. § 103(a) based upon the Pflaum and Liu references discussed above in view of additional, secondary references. However, these secondary references do not obviate the deficiencies of the Pflaum and Li references, as discussed above. Accordingly, all dependent claims are believed to be allowable at least by virtue of their dependency from an allowable base claim.

Conclusion

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

Date: January 23, 2007

A handwritten signature in black ink, appearing to read "John M. Rariden", written over a horizontal line.

John M. Rariden
Reg. No. 54,388
FLETCHER YODER
P.O. Box 692289
Houston, TX 77269-2289
(281) 970-4545